



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/788,589

02/27/2004

Ronald S. Karr

VRT0120US

6846

60429 7590 10/28/2008
CAMPBELL STEPHENSON LLP
11401 CENTURY OAKS TERRACE
BLDG. H, SUITE 250
AUSTIN, TX 78758

EXAMINER

CAMPOS, YAIMA

ART UNIT

PAPER NUMBER

2185

MAIL DATE

DELIVERY MODE

10/28/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/788,589	Applicant(s) KARR ET AL.	
	Examiner YAIMA CAMPOS	Art Unit 2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-16,26-28 and 31-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 5-16, 26-28, 31-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. As per the instant Application having Application number 10/788,589, the examiner acknowledges the applicant's submission of the amendment dated July 29, 2008. At this point, claims no claims have been amended, and claims 3-4, 17-25 and 29-30 remain canceled. Claims 1-2,5-16, 26-28 and 31-36 are pending.

REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-2, 5-8, 11-16, 26-28 and 31-34** are rejected under 35 U.S.C. 103(a) as being unpatentable by Wu et al. (US 7,216,133) in view of Suishu et al. (US 2005/0055523).

4. As per claim 1, Wu discloses A method comprising: generating first and second write transactions, wherein the first and second write transactions comprise first and second tags, respectively; **[updates to items in column 306 wherein each update has a local_cn in column 308 and a version in column 310 (Figures 3A and 3B and related text)]** transmitting the first and second write transactions to first and second storage devices, respectively; **[updates in logical view 110 in replica 102 contains are mapped to**

Art Unit: 2185

physical tables 105 and 106 and updates in logical view 112 in replica 104 are mapped to physical tables 107, 108 and 109 (fig. 1 and related text; col. 12, lines 52-62; col. 5, lines 25-65) which correspond to first and second storage devices wherein logical views are substantially similar to each other in different replicas to facilitate synchronization when updates are sent from a source replica to a destination replica (col. 11, lines 24-42)]

wherein the first write transaction comprises data D to be written; wherein the second write transaction comprises data D to be written; **[data items (col. 6, lines 18-40; figures 1 and 3A-3b and related text)]**

storing first write information in an entry of a first tag table, wherein the first write information comprises the first tag and an identity of a logical block of a first storage object where data D is to be written, wherein the first tag table is stored in first memory; **[updates written to replica 102 are stored in the combination of logical physical table and logical view synch table such as tables shown in figures 3A-3B and related text; wherein local_cn and version numbers correspond to a first tag wherein "the version in column 310 contains information about which replica made the change" (col. 8, lines 56-58) which corresponds to the identity of the logical block/view that made the change (See. Col. 6, lines 4-17). Wu further discloses synchronization/updating replicas at folder level wherein folders are logical constructs used for grouping items together (Col. 6, lines 18-40)]**

storing second write information in an entry of a second tag table, wherein the second write information comprises the second tag and an identity of a logical block of a second storage object where data D is to be written, wherein the second tag table is stored in

Art Unit: 2185

second memory [updates written to replica 104 are stored in the combination of logical physical table and logical view synch table as shown in figures 3A-3B and related text; wherein local_cn and version numbers correspond to a first tag wherein "the version in column 310 contains information about which replica made the change" (col. 8, lines 56-58) which corresponds to the identity of the logical block/view that made the change (See. Col. 6, lines 4-17). Wu further discloses synchronization/updating replicas at folder level wherein folders are logical constructs used for grouping items together (Col. 6, lines 18-40)].

To further detail Wu, Suishu discloses write transactions to first and second storage devices wherein write information such a write tags and identity of logical blocks wherein data is written is stored in first and second tables in first and second storage devices, respectively as [each storage systems 200, 100a and 100b shown in figure 1 stores a journal wherein "each journal is comprised of write data and update information. The update information is information for managing write data, and comprises of the time at which a write command was received (update time), a group number, an update number in the group information 600 described later, a logical address of the write command (*which corresponds to the identify of logical blocks*), the size of the write data, and the logical address in the journal logical volume where the write data is stored. The update information may have only either the time at which the write command was received or the update number (*which corresponds to tags*)" (pars. 0075-0076) wherein Suishu explains "in order to find the logical address of the update information with the update number designated by the secondary storage system 100B in the journal read reception processing, a table or

Art Unit: 2185

search method for finding a logical address storing the update information based on the update number can be provided in the shared memories 140 of the primary storage system 100A" (par. 0202) "in order to process journals in the order of update numbers in the restore processing, a table or search method for finding a logical address storing update information based on each update is provided in the secondary storage system 100b" (par. 0204)].

Wu and Suishu are analogous art in that they are of the same field of endeavor, that is, a system and/or method of memory control. Suishu suggests that it would have been desirable to incorporate information on write transactions such as tags and identity of logical blocks wherein this information is stored as journals searchable by tables in each storage device into the system of Wu because this would provide a reduction in the amount of information required for data replication while maintaining data integrity in a plurality of storage systems and would also provide high speed and efficient data recovery in case of failure [(par. 0014)]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Wu as suggested by Suishu to incorporate the feature as claimed.

5. As per claim 2, the combination of Wu and Suishu discloses The method of claim 1 further comprising: generating third and fourth write transactions, wherein the third and fourth write transactions comprise third and fourth tags, respectively; transmitting the third and fourth write transactions to the first and second storage devices, respectively [Wu discloses updates written to replicas 102 and 104 are stored in the combination of logical physical table and logical view synch table as shown in figures 3A-3B and related text; wherein local_cn and version numbers correspond to a first tag

Art Unit: 2185

wherein "the version in column 310 contains information about which replica made the change" (col. 8, lines 56-58) which corresponds to the identity of the logical block/view that made the change (See. Col. 6, lines 4-17). Wu further teaches updates in logical view 110 in replica 102 contains are mapped to physical tables 105 and 106 and updates in logical view 112 in replica 104 are mapped to physical tables 107, 108 and 109 (fig. 1 and related text; col. 12, lines 52-62; col. 5, lines 25-65) which correspond to first and second storage devices wherein logical views are substantially similar to each other in different replicas to facilitate synchronization when updates are sent from a source replica to a destination replica (col. 11, lines 24-42)] [With respect to these limitations, Suishu discloses each storage systems 200, 100a and 100b shown in figure 1 stores a journal wherein "each journal is comprised of write data and update information. The update information is information for managing write data, and comprises of the time at which a write command was received (update time), a group number, an update number in the group information 600 described later, a logical address of the write command (*which corresponds to the identify of logical blocks*), the size of the write data, and the logical address in the journal logical volume where the write data is stored. The update information may have only either the time at which the write command was received or the update number (*which corresponds to tags*)" (pars. 0075-0076; 0202 and 0204)].

6. As per claim 5, the combination of Wu and Suishu discloses The method of claim1 wherein: the first write transaction comprises data D to be written to a range of logical blocks of the first storage object; the second write transaction comprises data D to

Art Unit: 2185

be written to a range of logical blocks of the second storage object [**Wu discloses synchronization or updating replicas at folder level wherein folders are logical constructs used for grouping items together (Col. 6, lines 18-40) wherein items are stored within folder boundaries and folders are maintained in replicas shown in figure 1 and updates to any replica are synchronized with the other. Suishu discloses each storage systems 200, 100a and 100b shown in figure 1 stores a journal wherein “each journal is comprised of write data and update information. The update information is information for managing write data, and comprises of the time at which a write command was received (update time), a group number, an update number in the group information 600 described later, a logical address of the write command (*which corresponds to the identify of logical blocks*), the size of the write data, and the logical address in the journal logical volume where the write data is stored. The update information may have only either the time at which the write command was received or the update number (*which corresponds to tags*)” (pars. 0075-0076; 0202 and 0204)].**

7. As per claim 6, the combination of Wu and Suishu discloses The method of claim 5 wherein the first write information comprises an identity of the first storage object, and an identity of the range of logical blocks of the first storage object where data D is to be written, the second write information comprises, an identity of the second storage object, and an identity of the range of logical blocks in the second storage object where data D is to be written [**Wu discloses items are identified by item id in col. 306 (Figs. 3A and 3B and related text) and synchronization or updating replicas at folder level wherein folders are logical constructs used for grouping items together (Col. 6, lines**

Art Unit: 2185

18-40) wherein items are stored within folder boundaries and folders are maintained in replicas shown in figure 1 and updates to any replica are synchronized with the other and also explains items in logical views are mapped to physical tables by catalogs in both replicas (Figs. 1, and 3A-3B and related text). Suishu discloses each storage systems 200, 100a and 100b shown in figure 1 stores a journal wherein “each journal is comprised of write data and update information. The update information is information for managing write data, and comprises of the time at which a write command was received (update time), a group number, an update number in the group information 600 described later, a logical address of the write command (*which corresponds to the identify of logical blocks*), the size of the write data, and the logical address in the journal logical volume where the write data is stored. The update information may have only either the time at which the write command was received or the update number (*which corresponds to tags*)” (pars. 0075-0076; 0202 and 0204)].

8. As per claim 7, the combination of Wu and Suishu discloses the method of claim 1 further comprising comparing the contents of one entry in the first tag table with the contents of entries in the second tag table to determine whether the second tag table includes an entry that matches the one entry [**Wu discloses synchronization layer includes a “synchronization change tracker that maintains versions and synchronization local change enumerations for the one or more items mapped to the logical view” and wherein logical views are used to synchronize storage layers with one another; wherein local change enumerations and synchronization local change enumeration for different items are compared to determine when to update a**

Art Unit: 2185

replica and wherein updates are sent from one replica to another via logical views (Figs. 3A and 3B and related text; col. 11, lines 16-52)].

9. As per claim 8, the combination of Wu and Suishu discloses The method of claim 7 further comprising copying data, associated with the logical block number identified by the one entry, from the first storage object to the logical block in the second storage object if the second table lacks an entry with contents matching the contents of the one entry [Wu discloses “**sending at least one mapped item from the source replica to a destination replica... replica 102 sending items from logical view 110 to logical view 112**” (col. 11, lines 37-42). Suishu discloses **using journal information for replicating data from one logical volume to another (pars. 0011-0012; 0202 and 0204)]**.

10. As per claim 11, the combination of Wu and Suishu discloses The method of claim 1 further comprising: generating a write transaction to write data to a logical block of a data volume; incrementing a counter in response to generating the write transaction; generating the first and second tags as a function of an output of the incremented counter [Wu discloses **sending data from one replica to another thru logical views wherein “the local change enumeration associated with each item is incrementally updated each time a change is made to an item. The data storage layer 126 assigns local change enumerations to all changes irrespective of whether those changes are made through the user interface or received through synchronization”** (col. 7, lines 37-58; **figs. 1, 3A-3B and related text; col. 11, lines 37-42)**. Shuishu discloses **“update information may have only either the time at which the write command was received or the update number”** (pars. 0075-0076)].

Art Unit: 2185

11. As per claim 12, the combination of Wu and Suishu The method of claim 1 wherein the first and second storage devices comprise first and second object storage devices, respectively [**Wu discloses physical storage (col. 1, lines 16-51; col. 6, lines 18-40; fig. 1 and related text). Suishu discloses storage systems 200, 100a and 100b (figure 1 and related text).**].

12. As per claim 13, the combination of Wu and Suishu discloses The method of claim 1 wherein: the first write transaction comprises data D to be written to an extension of the first storage object; the second write transaction comprises data D to be written to an extension of the second storage object [**Wu discloses synchronization or updating replicas at folder level wherein folders are logical constructs used for grouping items together (Col. 6, lines 18-40) wherein items are stored within folder boundaries and folders are maintained in replicas shown in figure 1 and updates to any replica are synchronized with the other and also discloses change units and consistency units (col. 6, line 41-col. 7, line 36).**].

13. As per claim 14, the combination of Wu and Suishu The method of claim 13 further comprising: the first write information comprising an identity of the first storage object, and an indication that data D is to be stored in the extension of the first storage object, the second write information comprising an identity of the second storage object, and an indication that data D is to be stored in the extension of the second storage object [**Wu discloses synchronization or updating replicas at folder level wherein folders are logical constructs used for grouping items together (Col. 6, lines 18-40) wherein items are stored within folder boundaries and folders are maintained in replicas**

Art Unit: 2185

shown in figure 1 and updates to any replica are synchronized with the other and also discloses consistency units and change units (col. 6, line 41-col. 7, line 36)].

14. As per claim 15, the combination of Wu and Suishu discloses A method comprising: generating first and second write transactions; wherein the first and second write transactions comprise first and second tags, respectively, wherein the first and second tags are identical to each other; transmitting the first and second write transactions to first and second storage devices, respectively; wherein the first write transaction comprises data D; wherein the second write transaction comprises data D; storing first write information in an entry of a first tag table, wherein the first write information comprises the first tag and an identity of a logical block of a first storage object where data D is to be written, wherein the first tag table is stored in first memory; storing second write information in an entry of a second tag table wherein the second write information comprises the second tag and an identity of a logical block of a second storage object where data D is to be written, wherein the second tag table is stored in second memory **[The rationale in the rejection to claim 1 is herein incorporated].**

15. As per claim 16, the combination of Wu and Suishu discloses The method of claim 1: wherein a computer system generates the first and second write transactions in response to generation of a write transaction by a first application executing on the computer system, wherein the first and second tags are generated by a first tag generator; a second computer system generating third and fourth transactions in response to generation of a write transaction by a second application executing on the second computer system; wherein the third and fourth write transactions comprise third and fourth tags, respectively, wherein the third and fourth tags are generated by a second tag

Art Unit: 2185

generator **[Wu discloses incrementally updating local change enumeration which may be received from a user interface or a result of synchronization (col. 7, lines 37-58) wherein user interface may use procedures or functions code (col. 5, lines 43-51)].**

16. As per claim 26, the combination of Wu and Suishu One or more computer readable mediums storing executable instructions executable, wherein a method is implemented in response to executing the instructions, the method comprising: in response to receiving a first transaction comprising a first tag and data D, storing first write information in an entry of a first tag table, wherein the first write information comprises the first tag and an identity of a logical block of a first storage object where the data D is to be written, wherein the first tag table is stored in first memory; in response to receiving a second write transaction comprising a second tag and data D storing second write information in an entry of a second tag table, the second write information comprising the second tag and an identity of the logical block of a second storage object where data D is to be written, wherein the second tag table is stored in second memory **[The rationale in the rejection to claim 1 is herein incorporated].**

17. As per claim 27, the combination of Wu and Suishu discloses The method of claim 1 further comprising: synchronizing said first and second storage devices in response to an entry of the first tag table not matching an entry of the second tag table **[Wu discloses updates written to replicas 102 and 104 are stored in the combination of logical physical table and logical view synch table as shown in figures 3A-3B and related text; wherein local_cn and version numbers correspond to a first tag wherein "the version in column 310 contains information about which replica made**

Art Unit: 2185

the change" (col. 8, lines 56-58) which corresponds to the identity of the logical block/view that made the change (See. Col. 6, lines 4-17). Wu further teaches updates in logical view 110 in replica 102 contains are mapped to physical tables 105 and 106 and updates in logical view 112 in replica 104 are mapped to physical tables 107, 108 and 109 (fig. 1 and related text; col. 12, lines 52-62; col. 5, lines 25-65) wherein a "synchronization change tracker that maintains versions and synchronization local change enumerations for the one or more items mapped to the logical view" and wherein logical views are used to synchronize storage layers with one another; wherein local change enumerations and synchronization local change enumeration for different items are compared to determine when to update a replica and wherein updates are sent from one replica to another via logical views (Figs. 3A and 3B and related text; col. 11, lines 16-52)].

18. As per claim 28, the combination of Wu and Suishu discloses A method comprising: generating first and second write transactions; generating first and second tags; transmitting the first write transaction to first storage device; transmitting the second write transaction to second storage device; transmitting the first tag to the first storage device; transmitting the second tag to the second storage device; wherein the first write transaction comprises data D to be written; wherein the second write transaction comprises data D to be written; receiving the first write transaction at the first storage device; receiving the first tag at the first storage device; storing the first write information in an entry of a first tag table, wherein the write information comprises the first tag and an identity of a logical block of a first storage object where data D is to be written, wherein the first tag table is stored in first memory; receiving the second write transaction

Art Unit: 2185

at the second storage device; receiving the second tag at the second storage device; storing the second write information in an entry of a second tag table, wherein the write information comprises the second tag and an identity of a logical block of a second storage object where data D is to be written, wherein the second tag table is stored in second memory [**The rationale in the rejection to claim 1 is herein incorporated**].

19. As per claim 31, the combination of Wu and Suishu discloses The one or more computer readable memories of claim 26 wherein: the first write transaction comprises data D to be written to a range of logical blocks of the first storage object; the second write transaction comprises data D to be written to a range of logical blocks of the second storage object [**The rationale in the rejection to claim 5 is herein incorporated**].

20. As per claim 32, the combination of Wu and Suishu discloses The one or more computer readable memories of claim 31 wherein: the first write information comprises an identity of the first storage object, and an identity of the range of logical blocks of the first storage object where data D is to be written; the second write information comprises an identity of the second storage object, and an identity of the range of logical blocks in the second storage object where data D is to be written [**The rationale in the rejection to claim 6 is herein incorporated**].

21. As per claim 33, the combination of Wu and Suishu discloses The one or more computer readable memories of claim 26 wherein the method further comprises comparing the contents of one entry in the first tag table with the contents of entries in the second tag table to determine whether the second tag table includes an entry that matches the one entry [**The rationale in the rejection to claim 7 is herein incorporated**].

Art Unit: 2185

22. As per claim 34, the combination of Wu and Suishu discloses The one or more computer readable memories of claim 33 wherein the method further comprises copying data, associated with the logical block number identified by the one entry, from the first storage object to the logical block in the second storage object if the second table lacks an entry with contents matching the contents of the one entry [**The rationale in the**

rejection to claim 8 is herein incorporated].

23. **Claims 9-10 and 35-36** are rejected under 35 U.S.C. 103(a) as being unpatentable by Wu et al. (US 7,216,133) in view of Suishu et al. (US 2005/0055523) as applied to claims 1 and 7 above, and further in view of Crockett et al. (US 6,088,697).

24. As per claims 9-10 and 35-36, the combination of Wu and Suishu The method of claim 7, including [**Suishu discloses freeing updates having equal or less update numbers in journals, indicating the journal has been transmitted to the replica storage system (col. 0216)**] but does not disclose expressly deleting the one entry in the first table if the second table contains an entry with contents that match the contents of the one entry; deleting the entry in the second table with contents that match the contents of the one entry.

Crockett discloses [**a remote copy system in which a data structure maintains changes made to a primary data storage system and wherein the changes that have been applied to a secondary data storage volume are discarded from the data structure and the changes that have not been applied are maintained in the data structure (col. 1, lines 52-67)**].

Wu, Suishu and Crockett are analogous art in that they are of the same field of endeavor, that is, a system and/or method of memory control. Crockett suggests that it

Art Unit: 2185

would have been desirable to incorporate the ability to delete entries that have already been sent from one storage system to another from a table or data structure into the system of Wu and Suishu because this would provide improvement in performing remote copy operations for duplication of volumes from a primary site to a secondary site and minimizing clean-up time and time for synchronization or re-synchronizations [(col. 1, lines 52-67; col. 2, lines 60-64)]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Wu and Suishu as suggested by Crockett to incorporate the feature as claimed.

ACKNOWLEDGMENT OF ISSUES RAISED BY THE APPLICANT

Response to Amendment

25. Applicant's arguments filed on July 29, 2008 have been fully considered but are not persuasive.

ARGUMENTS CONCERNING PRIOR ART REJECTIONS

26. Claims must be given the broadest reasonable interpretation during examination and limitations appearing in the specification but not recited in the claim are not read into the claim (See M.P.E.P. 2111 [R-1]).

27. Applicant argues the combination of Wu and Suishu does not disclose “storing first write information in an entry of a first tag table, where the first write information comprises the first tag and an identity of a logical block of a first storage object where data D is to be written, wherein the first tag table is stored in first memory” since no entry in the logical physical tables which maps from logical to physical tables of Wu teaches “an identity of a logical block of a first storage object where data D is to be written.”

Art Unit: 2185

In response, these arguments have fully considered, but are not deemed persuasive.

First, the Examiner respectfully submits that the pending claims have been rejected under 35 U.S.C 103 obviousness type rejection, and in response to Applicant's arguments directed against Wu individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The combination of Wu and Suishu discloses "an identity of a logical block of a first storage object where data D is to be written" as Wu discloses **[mapping updates in logical views to physical tables (fig. 1 and related text; col. 12, lines 52-62; col. 5, lines 25-65) wherein "the physical tables are an actual arrangement of the data at a computer storage device such as a database mass storage array, a computer hard drive or flash memory" (col. 1, lines 47-50) and explains "catalogs at each replica control mapping from the physical layout to the logical view to cause logical views to be substantially similar. The computer system sends at least one item mapped to the logical view to the destination replica" (col. 3, lines 27-37) wherein Applicant should note that in order to map/translate from a logical view to physical locations and maintain substantially similar logical views, the identity of each logical block corresponding to each physical block comprising an update must inherently be present. Further, note that item column 306 in logical view 110 stores the identity of the items mapped (col. 7, lines 36-col. 8, line 4) and "the version in column 310 contains information about which replica made the change" (col. 8, lines 55-58);**

Art Unit: 2185

thus indicating the logical identity of blocks where data of storage objects are to be written/mapped] and Suishu further explicitly discloses [**“each journal is comprised of write data and update information. The update information is information for managing write data, and comprises... a logical address of the write command (which corresponds to the identify of logical block where data is to be written).... logical address in the journal logical volume where the write data is stored”** (pars. 0075-0076); **thus evidently disclosing maintaining "an identity of a logical block of a first storage object where data D is to be written," as claimed]** wherein it would have been obvious to one having ordinary skill in the art to explicitly include an identity of the logical block where data is to be written as taught by Suishu in the system of Wu, since Suishu suggests this would provide a reduction in the amount of information required for data replication while maintaining data integrity in a plurality of storage systems and would also provide high speed and efficient data recovery in case of failure [(par. 0014)].

28. Regarding all other Claims not specifically traversed above and whose rejections were upheld, the Applicant contends that the listed claims are allowable by virtue of their dependence on other allowable claims. As this dependence is the sole rationale put forth for the allowability of said dependent claims, the Applicant is directed to the Examiner's remarks above. Additionally, any other arguments the Applicant made that were not specifically addressed in this Office Action appeared to directly rely on an argument presented elsewhere in the Applicant's response that was traversed, rendered moot or found persuasive above.

Art Unit: 2185

29. All arguments by the applicant are believed to be covered in the body of the office action; thus, this action constitutes a complete response to the issues raised in the remarks dated July 29, 2008.

CLOSING COMMENTS

Conclusion

30. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Examiner's Note

31. Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the

Art Unit: 2185

references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

When responding to this Office Action:

12. Applicant is requested to indicate where in the disclosure support is to be found for any new language added to the claims by amendment. 37 C.F.R. § 1.75(d)(1) requires such support in the Specification for any new language added to the claims and 37 C.F.R. § 1.83(a) requires support be found in the Drawings for all claimed features.

32. Applicant must clearly point out the patentable novelty which he or she thinks the claims present, in view of the state of the art disclosed by the references cited or the objections made, and must also explain how the amendments avoid the references or objections. See 37 C.F.R. § 1.111(c).

a. STATUS OF CLAIMS IN THE APPLICATION

33. The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. 707.07(i)**:

a(1) CLAIMS REJECTED IN THE APPLICATION

34. Per the instant office action, claims 1-2, 5-16, 26-28, and 31-36 have received an action on the merits and are subject of a final rejection.

a(2) CLAIMS NO LONGER UNDER CONSIDERATION

35. Claims 3-4, 17-25 and 29-30 have been canceled as of amendment dated July 29, 2008.

b. DIRECTION OF FUTURE CORRESPONDENCES

Art Unit: 2185

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yaima Campos whose telephone number is (571) 272-1232. The examiner can normally be reached on Monday to Friday 8:30 AM to 5:00 PM.

37. If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Sanjiv Shah, can be reached at the following telephone number: Area Code (571) 272-4098.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

October 23, 2008

/Yaima Campos/
Examiner, Art Unit 2185

/Sanjiv Shah/

Supervisory Patent Examiner, Art Unit 2185